

*Sub A7*

WHAT IS CLAIMED IS:

1. An interference cancellation apparatus, applied in the CDMA communication system in which transmission rate information for each user in a plurality of users is known, and 5 which sequentially cancels the interference among said users based on a rank of each of said user, said apparatus comprising:

a rank determination unit which determines the rank of each of said user based on the known transmission rate information for that particular user.

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2. The interference cancellation apparatus applied in the CDMA communication system according to claim 1 further comprising:

a level ranking determination unit which determines the rank of each of said user based on the level of the incoming signal when the incoming signal is a signal on which transmission power control is not executed.

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3. An interference cancellation apparatus, applied in the CDMA communication system according to claim 1 further comprising:

a plurality of interference cancellation units, connected by at least a number of stages corresponding to the number of said users, each of which performs interference 25 cancellation based on a rank provided in each stage, and each

of which detects the transmission rate information; and  
a rank updating unit which updates the rank to be used  
in interference cancellation units of the following stage based  
on the transmission rate information detected in each of said  
5 interference cancellation units.

4. The interference cancellation apparatus applied in the  
CDMA communication system according to claim 3, wherein the  
first interference cancellation unit out of said plurality of  
10 interference cancellation units stores the rank of said users  
obtained in the previous calculation and uses this rank for the  
current calculation.

5. The interference cancellation apparatus applied in the  
15 CDMA communication system according to claim 3 further  
comprising:

a level ranking determination unit which determines the  
rank of each of said user based on the level of the incoming  
signal when the incoming signal is a signal on which  
20 transmission power control is not executed.

6. An interference cancellation apparatus, applied in the  
CDMA communication system in which transmission rate  
information and required quality information for each user in  
25 a plurality of users is known, and which sequentially cancels

the interference among ) said users based on a rank of each of  
said user, said apparatus comprising:

5 a rank determination unit which determines the rank of  
each of said user based on the known transmission rate  
information and the required quality information for that  
particular user.

7. The interference cancellation apparatus applied in the  
CDMA communication system according to claim 6, wherein said  
10 rank determination unit estimates the incoming signal power for  
each of said users based on the product of the transmission rate  
information and the required quality information for respective  
user, and determines the rank of each of said user based on the  
estimated incoming signal power.

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8. The interference cancellation apparatus applied in the  
CDMA communication system according to claim 6 further  
comprising:

20 a level ranking determination unit which determines the  
rank of each of said user based on the level of the incoming  
signal when the incoming signal is a signal on which  
transmission power control is not executed.

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9. An interference cancellation apparatus, applied in the CDMA communication system according to claim 6 further comprising:

5 a plurality of interference cancellation units, connected by at least a number of stages corresponding to the number of said users, each of which performs interference cancellation based on a rank provided in each stage, and each of which detects the transmission rate information; and

10 a rank updating unit which updates the rank to be used in interference cancellation units of the following stage based on the transmission rate information detected in each of said interference cancellation units and the known required quality information.

15 10. The interference cancellation apparatus applied in the CDMA communication system according to claim 9, wherein said rank determination unit estimates the incoming signal power for each of said users based on the product of the transmission rate information and the required quality information for respective 20 user, and updates the rank of each of said user based on the estimated incoming signal power.

11. The interference cancellation apparatus applied in the CDMA communication system according to claim 9, wherein the 25 first interference cancellation unit out of said plurality of

interference cancellation units stores the rank of said users obtained in the previous calculation and uses this rank for the current calculation.

5 12. The interference cancellation apparatus applied in the CDMA communication system according to claim 9 further comprising:

10 a level ranking determination unit which determines the rank of each of said user based on the level of the incoming signal when the incoming signal is a signal on which transmission power control is not executed.

15 13. An interference cancellation apparatus, applied in the CDMA communication system in which transmission rate information for some users in a plurality of users is known but for other users is unknown and required quality information for all said users is known, and which sequentially cancels the interference among said users based on a rank of each of said user, said apparatus comprising:

20 a plurality of interference cancellation units, connected by at least a number of stages corresponding to the number of said users, each of which performs interference cancellation based on a rank provided in each stage, and each of which detects the transmission rate information;

25 a rank determination unit which determines the rank of

each of said user whose transmission rate information is known based on the known transmission rate information and required quality information for that particular user;

5 a rank updating unit which, for the users whose transmission rate information is unknown, updates the rank to be used in interference cancellation units of the following stage based on the transmission rate information detected in each of said interference cancellation units and the known required quality information; and

10 a selection unit which selects the rank determined by said ranking determination unit for said users whose transmission rate information is known, and selects the rank updated by said ranking updating unit for said users whose transmission rate information is unknown.

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14. An interference cancellation apparatus, applied in the CDMA communication system according to claim 13 further comprising:

20 a plurality of interference cancellation units, connected by at least a number of stages corresponding to the number of said users, each of which performs interference cancellation based on a rank provided in each stage, and each of which detects the transmission rate information;

25 a rank determination unit which determines the rank of each of said user whose transmission rate information is known

based on the known transmission rate information for that particular user;

a rank updating unit which, for the users whose transmission rate information is unknown, updates the rank to be used in interference cancellation units of the following stage based on the transmission rate information detected in each of said interference cancellation units; and

a selection unit which selects the rank determined by said ranking determination unit for said users whose transmission rate information is known, and selects the rank updated by said ranking updating unit for said users whose transmission rate information is unknown.

15. The interference cancellation apparatus applied in the CDMA communication system according to claim 13, wherein said rank determination unit estimates the incoming signal power for each of said users based on the product of the transmission rate information and the required quality information for respective user, and determines the rank of each of said user based on the estimated incoming signal power.

16. The interference cancellation apparatus applied in the CDMA communication system according to claim 13, wherein said rank determination unit estimates the incoming signal power for each of said users based on the product of the transmission rate

information and the required quality information for respective user, and updates the rank of each of said user based on the estimated incoming signal power.

5 17. The interference cancellation apparatus applied in the CDMA communication system according to claim 13, wherein the first interference cancellation unit out of said plurality of interference cancellation units stores the rank of said users obtained in the previous calculation and uses this rank for the 10 current calculation.

18. The interference cancellation apparatus applied in the CDMA communication system according to claim 17, wherein said first interference cancellation unit follows the rank 15 determined in said rank determination unit when said selection unit has selected said rank determination unit, and follows the stored rank when said selection unit has selected said rank updating unit.

20 19. The interference cancellation apparatus applied in the CDMA communication system according to claim 17, wherein when there is a user whose rank is not stored in the previous calculation, then said first interference cancellation unit determines the rank of that particular user to be the highest 25 one.

20. The interference cancellation apparatus applied in the CDMA communication system according to claim 13 further comprising:

5 a level ranking determination unit which determines the rank of each of said user based on the level of the incoming signal when the incoming signal is a signal on which transmission power control is not executed.

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